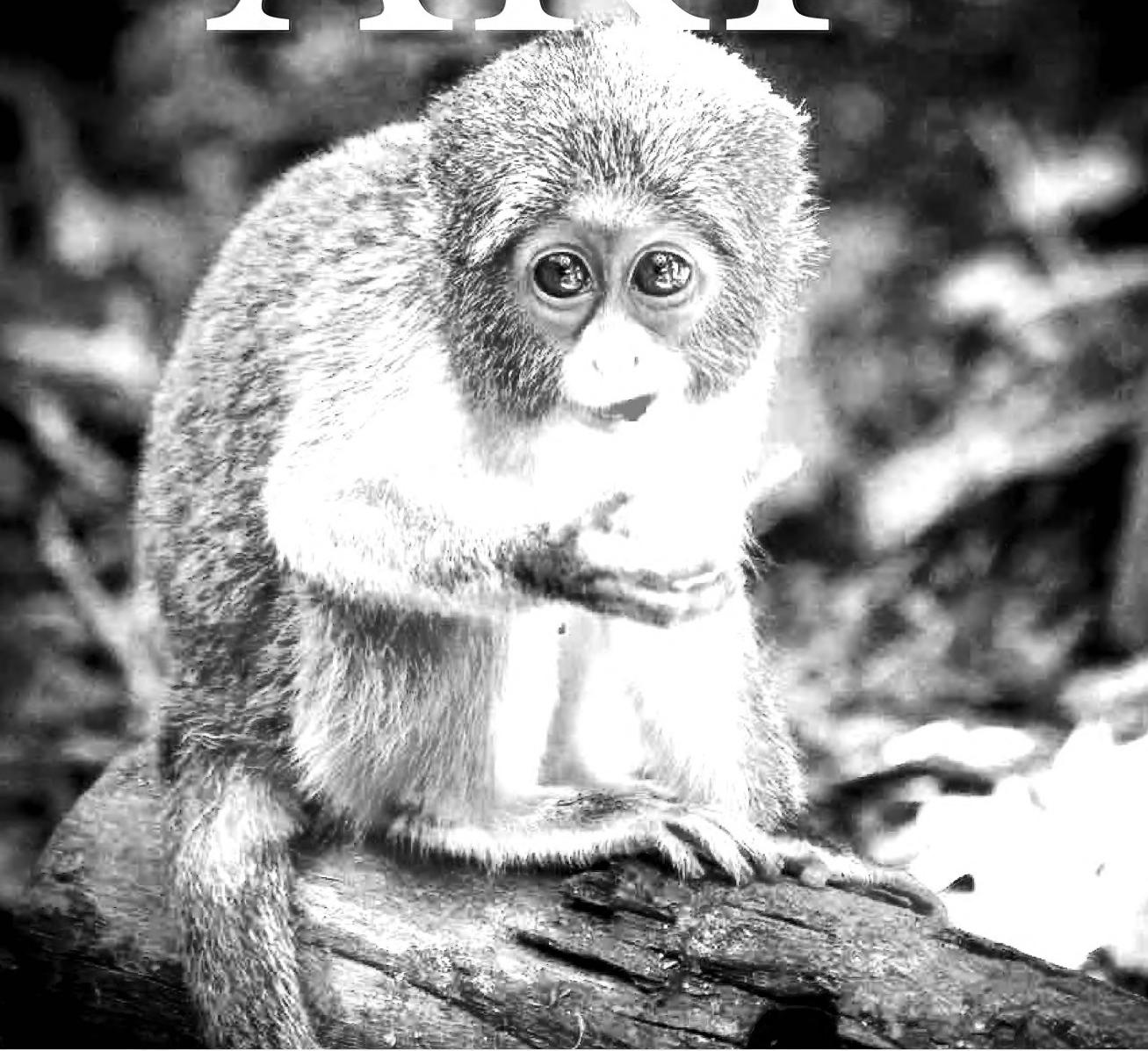


The Journal of the American Association of Zoo Keepers, Inc.

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ABOUT THE COVER

This month's cover photo comes to us from Dane Jorgensen of Omaha's Henry Doorly Zoo and features a De Brazza's monkey (*Cercopithecus neglectus*). De Brazza's monkey is an Old World monkey endemic to the riverine and swamp forests of central Africa. The largest species in the guenon family, it is one of the most widespread arboreal African primates. Their scientific species name, *neglectus*, which means to pay no attention to, was given to them because of their ability to hide from both humans and predators. The De Brazza's monkey is listed as least concern by the IUCN Red List. Their main threats are deforestation due to logging and agriculture, and bushmeat hunting. The Association of Zoos and Aquariums manages a captive population under a Yellow Species Survival Plan®.

De Brazza's monkeys are very distinct looking. They are grey with black limbs and tail, with a long white beard, white muzzle and orange crown. There is a size difference between male and female De Brazza's monkeys. The females weigh an average of 8 1/2 pounds, and the males average around 15 pounds. Body lengths range between 16 and 25 inches. De Brazza's monkeys usually forage in open spaces, making them vulnerable to predation. To minimize this time of vulnerability, they have cheek pouches to store extra food. When scared, De Brazza's monkeys freeze to avoid detection from predators.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

Deadline for each regular issue is the 3rd of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the Editor.

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At a time when the AAZK membership and those in their lives faced many of the same financial concerns that conservation organizations face, they stepped up in a major way and more than doubled the fundraising goal.

A popular saying during the COVID-19 pandemic is that “we’re all in this together.” And despite sharing an idea with a decade-old tween anthem, this does hold true for keepers. The togetherness we feel with one another is evident in the outpouring of support, photos, and videos being shared via online resources and connecting with friends and coworkers near and far. But recent AAZK events have demonstrated both the accomplishments and challenges of keeping unity in the organization during the crisis.

Joining together and rallying behind the online fundraising for Bowling for Rhinos was incredible! The Bowling for Rhinos Conservation Partners are at risk right now, but an incredible one-day explosion of support saw AAZK raise over \$10,000 in support of the BFR program. At a time when the AAZK membership and those in their lives faced many of the same financial concerns that conservation organizations face, they stepped up in a major way and more than doubled the fundraising goal. Hopefully, these efforts continue as the world starts spinning again and both Chapters and individuals are able to re-establish the incredible giving efforts that AAZK has grown over the years through programs such as Bowling for Rhinos and Trees for You and Me.

Reaching out to ensure that other keepers feel supported has also sprung up. A “pay-it-forward” membership idea was proposed by an individual AAZK member wishing to pay for an individual membership for any expiring members that may be struggling financially during COVID-19. Word of the idea spread and soon many members were contacting the AAZK office to ask how they could help. This desire to support other members at a time of need truly demonstrates the atmosphere of unity within the animal care community. This same desire to support and buoy others in the animal care profession comes out of the work of AAZK Committees and Programs as teams such as National Zoo Keeper Week and International Outreach Committee seek to provide recognition for hard work in crisis and support for Latin American keeper staff respectively.

However, the postponement of the 46th AAZK National Conference in Los Angeles is a major challenge for bringing the organization together during the pandemic. Many AAZK members look forward to reuniting with friends, learning about new ideas and procedures in the animal care profession, and getting reinvigorated to support their facilities and local Chapters after the Conference. However, I can’t think of a group better suited to meet the challenge and overcome it than AAZK members and animal care professionals. So stay tuned for more information about how AAZK will continue to engage with all of you during a difficult time and stay safe.

Regards,

A handwritten signature in black ink, appearing to read "Paul".

Paul



AAZK National Conference to be rescheduled in 2021

Due to the continually evolving uncertainty that surrounds the Covid-19 Pandemic and in compliance with the current restrictions and future recommendations imposed by the State of California and the cities of Los Angeles and Glendale, the Board of Directors of the American Association of Zoo Keepers (AAZK) in direct consultation with the Los Angeles AAZK Chapter will postpone and reschedule the National Conference of the Association scheduled for August 30 – September 3, 2020.

"The zoo and aquarium industry as a whole has suffered from closures since mid-March and is just now beginning a slow, planned recovery and reopening process as allowed by local restrictions. It's optimistic to state that most facilities will be fully operational by mid-summer. Keepers in many facilities have been subject to reduced pay, reduced hours and

furloughs. Combine the uncertainties of projecting virus cases through the summer across North America, the safety of the delegates, LA zoo and hotel staff, and the financial impact the virus is having on keepers in general, we feel the decision to postpone the conference is the right call to make" says Paul Brandenburger, President of AAZK.

AAZK has rescheduled the National Conference to Aug. 29 – Sep. 2, 2021

AAZK has rescheduled the National Conference to August 29 – September 2, 2021 at the Hilton Los Angeles North Glendale. Those who have registered for the 2020 AAZK Conference and those who have been scheduled as

Instructors, Presenters, Exhibitors and Sponsors will be contacted in the very near future by AAZK and our Conference Host regarding cancellation or rescheduling options necessitated by the postponement.

The American Association of Zoo Keepers exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

If you would like more information regarding this announcement, please contact Ed Hansen, AAZK CEO/CFO at 520-298-9688 or email at Ed.Hansen@aazk.org.





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LA / AAZK

DUE TO TRAVEL & SOCIAL RESTRICTIONS
— CAUSED BY COVID-19 —

AAZK & the Los Angeles AAZK Chapter have made the difficult decision to postpone the 46th Annual AAZK National Conference



PHOTO BY TAB MOTOLKA

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Pseudopregnancy in North American River Otters

Molly Lippincott, Animal Care Manager, Florida Mammals Department

Jaime Vaccaro, Animal Care Supervisor, Florida Mammals Department

Amanda Wininsky, Animal Care Professional, Florida Mammals Department

Lisa Smith, Animal Care Professional, Florida Mammals Department

Jenn Galbraith, Senior Animal Care Professional, Florida Mammals Department

ZooTampa at Lowry Park, Tampa, Florida



Denning log after Harriet arranged the bedding material offered to her. Photo by Molly Lippincott.

Introduction

Pseudocyesis, or pseudopregnancy, is defined as a condition in which a female believes she is pregnant when she is not. Certain signs and symptoms suggest pregnancy, although conception has not occurred and therefore there is no embryonic development (Mosby, 1998).

When a female otter is going through pseudopregnancy, she exhibits all the signs that are associated with an actual pregnancy. Such signs include nest building, abdominal distension, swollen mammae, decreased appetite, restlessness, and lethargy.

In animals, it is most commonly seen in dogs and mice. Very little has been written about pseudopregnancy in North American River Otters, captive or wild.

When our female river otter at ZooTampa went through a pseudopregnancy, we had minimal information available to us regarding this behavior. The purpose behind this article is to share our experiences caring for a female river otter during a time of pseudopregnancy. Below is the story of Harriet and her journey through behavioral and social dynamic changes.

Natural History

North American river otters are small, carnivorous mammals that live near the water's edge of rivers, lakes, and swamps across North America. They are known for their playful antics and powerful swimming. They feed primarily on aquatic organisms such as amphibians, fish, crayfish, and other invertebrates.

They have a variety of social groupings, but are most commonly found as adult females with pups, groups of males, and solitary males. Female North American river otters become sexually mature at around two years of age. Males tend not to be successful at breeding until around five.

The North American river otter estrous period is from November to June and is dependent on latitude. In southern latitudes, such as Florida, estrus occurs typically around November or December (42-46 days). They experience delayed implantation, with parturition occurring around December or January (actual gestation 60-63 days) (Reed-Smith, 2008).



They usually have two to three pups.

Delayed implantation in otters is caused by seasonal changes and has the potential benefit of raising young in a season rich in food and ideal conditions. It is a reproductive strategy where the embryo does not immediately implant in the uterus and is maintained in a state of dormancy. While the embryo remains unattached to the uterine wall, there is little or no development. This results in the extension of the gestation period for a species-specific time (Reed-Smith, 2008).

Harriet's Background

Harriet was found under a car in Largo,

Florida in March of 2007. A citizen took her to the Largo ASPCA. She was given a new home at the zoo and was brought to the vet clinic to stay during quarantine. She weighed a little under three pounds.

After quarantine, she was released to the Florida Mammals department. Harriet was introduced to another otter pup, a female, of roughly the same age. They got along very well. After a week, introductions began with the two adult otters, a male and female, and within one week all the otters were together during the day.

Over the course of a couple of years, the

otter group became two females and a male. Harriet got along with both at all times but the older female Tommi would become aggressive towards the male during the winter. At this time, those two would have to be separated. Harriet would be with one or the other at all times.

Pseudopregnancy History at ZooTampa
Previously at ZooTampa, we had a female North American River Otter named Tommi. She was housed with Harriet from March 2007 until her death in October 2015. During the time that Harriet and Tommi were housed together, Tommi was always dominant over Harriet. At the time of introductions, Tommi was a sexually mature adult at three-years-old and Harriet was a juvenile. Tommi had already shown yearly signs of pseudopregnancy. Typical signs that Tommi was going through a pseudopregnancy included behavioral changes such as increased aggression, increased grooming, and decreased appetite and activity. She would also begin to collect bedding materials and stay indoors in a den for days at a time. In 2006 and 2010, Tommi also displayed physical changes such as enlarged mammas and vulva. Her pseudopregnancies would typically last from October until February or March. During this time, Tommi would typically spend time sucking on one of her paws, swim while holding a paw in her mouth, and walk around while biting the skin on her neck, as if she was scuffing herself. It appeared that when she displayed these behaviors, she believed she was scuffing and carrying around a pup. Harriet exhibited the majority of these behaviors during her pseudopregnancy as well. One difference noticed is that Harriet refused to go outside and remained protective over her den for three months, whereas Tommi typically never stayed in for more than a few days at a time.

Pseudopregnancy History at Other Facilities

In 1997, the John Ball Zoological Garden in Michigan had a female go through a pseudopregnancy. This female was reported to have had offspring previous years. In 1997 from April to May, their female began to gain weight and began denning. The John Ball Zoological

Garden noted that a juvenile offspring of the female had attempted to breed her that year and they believe this could have been a contributing factor in causing her to have a pseudopregnancy (Reed-Smith, 2008).

The Seneca Park Zoo in New York also reported a female displaying a pseudopregnancy in 1994. Their female was housed with three companions at the time and displayed increased nesting behavior, aggression towards companions, mammary development, and visible teats. Routine radiographs were able to determine this was a false pregnancy (Reed-Smith, 2008).

Harriet's Pseudopregnancy

The passing of Tommi in October 2015 resulted in a social dynamic change that lead to a difference in behavior in Harriet. After cohabitating with Tommi for eight years, Harriet became the only female housed with our male. These variations in behavior showcased mainly as estrous and prenatal behavior and we started to observe them slowly over the years following Tommi's death. There were physical alterations noticed such as prominent mammae visibility and behavioral changes such as actively pacing in her indoor and habitat pools and slight aggression toward the male. These changes typically occurred between the months of December thru February. However, the most dramatic of behavioral displays began in the end of 2017.

Beginning in November 2017, Harriet who has always maintained a healthy appetite- began to exhibit a decline in diet consumption. Desire for the diet was present but overall she ate sparingly and gingerly. For about a week, her appetite rapidly decreased and she became sluggish. Her weight had increased and her belly appeared to be larger and droopy, resting low. She was frequently pacing within the pools and at times seemed agitated. Staff began to think that these could all be signs of pregnancy and started to offer her bedding material to take into a hollowed den log, which already existed in her den. She had started rubbing her face rapidly and recurrently, and as the week unfolded, we realized that she was experiencing dental issues. During her dental procedure, an ultrasound was

done and pregnancy suspicions were inconclusive- nothing could be seen.

Following her dentals, Harriet's behavior and appetite were back to "normal" for about a week. During the month of December, she continued to relay suspicions of pregnancy. The pacing of pools became a daily activity and she continued to groom with the male but also became aggressive toward him. By the end of January 2018, staff had to separate them, as the aggression escalated. Both otters showed open mouths and vocalized but Harriet pawed so heavily at the meshed gate that separated them, that she ripped a toenail off twice. Harriet would incessantly groom herself throughout the day, both in and outside of the den log. Staff started to notice enlarged, reddened teats on Harriet, and observed her grooming and suckling the area, as well as around her vulva. She lacked interest in her diet, and sometimes did not get out of her den log to eat at all during the day. Harriet's participation in training also diminished. Staff offered bedding material such as hay, leaves, and shredded paper. She made a large nest in the den log and this nest lasted for several months- often she removed the bedding and then would remake the nest many times.

By February 2018, Harriet's fur was thinning and shedding. She had become aggressive to large enrichment items, which was unusual for her. She frequently went without eating or just eating once a day. She exhibited slight interest in going outside but would want right back in. Since Harriet continued to show signs of pregnancy, staff was still expecting pups and had made sure to have a heat lamp, dry floor, hay/bedding available and kept her surroundings quiet and dark.

Unfortunately, by March, no pups had been seen. Staff was sure at this point that she was not pregnant. Her weight stayed stagnant between 10.9kg (24 lbs) and 10.45kg (23 lbs) over the three months, which was her average weight. Staff began giving her access to habitat when she was more active in the mornings. Around the middle of March on one of the mornings, we gave her access and she went out on her own and swam and explored the habitat for

a short period. A few days later, she was waiting at her door to go out on habitat, something she had not done in months. She immediately ventured outside and went swimming. Staff stopped offering hay in the third week of March to discourage further denning. By 18 March 2018, she had been denning inside for 77 days. At the end of March, she was showing less signs of aggression towards the male through the mesh. Some vocalizing was observed but not as long or as loud. She was up in the mornings for her diet and began participating in training sessions with her keeper staff. On 23 March 2018, she was introduced back to the male on habitat. They spent the entire day together with only small amounts of bickering and otherwise grooming and playing with one another. To take extra caution they were separated from each other overnight. In another week, we were able to allow them to have access to one another at all times with no issue. Harriet was back to her pre-pseudopregnancy behaviors.

Conclusion

The ZooTampa Florida Mammals' intent on writing this paper was to share our experiences in working with female North American river otters, whom have exhibited signs of pregnancy that were not a consequence of conception and therefore a pseudopregnancy.

We believe that Harriet never experienced pseudopregnancy until the passing of her cohabitant, Tommi, due to Tommi being the Alpha female. However, as soon as Tommi passed away, Harriet readily began showing signs of estrus and pregnancy.

We believe that Harriet never experienced pseudopregnancy until the passing of her cohabitant, Tommi, due to Tommi being the Alpha female.



To assist in the determination of pregnancy, modifying our otter night house, to accommodate husbandry behaviors, could lead to better confirmation of pregnancy. This includes being able to obtain blood samples and ultrasound, of which ultrasound would be more beneficial, given the gestation period. Fecal samples can confirm non-pregnancy but also promote a false positive. While our staff can only speculate as to the benefits of pseudopregnancy, many questions still remain; might it be to keep the interest of a male otter, or is a female deemed more appealing if exhibiting the

signs of pregnancy? Do females housed with only other females still show this behavior? As we continue to explore the occurrence of pseudopregnancy, feel free to contact us with any experiences and information you may have of pseudopregnancy in North American River Otters. (florida.mammals@zootampa.org) 

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Maintaining Exhibit Water Quality Saving Time and Space Using Inexpensive Sustainable Constructed Wetlands

*Kathleen Gries
Zoo Specialist, Ochsner Park Zoo, Baraboo, Wisconsin*

*John Ferris, PE
Civil Engineer, Ferris Water Resources, Cedarburg, Wisconsin*

Splashing, diving, swimming and bathing are activities that water features provide our animals, and the public loves them too. Unfortunately, they can require a lot of time for cleaning, scrubbing, and filtering to keep the water healthy for our animals, and attractive for zoo patrons. At Ochsner Park Zoo, in Baraboo WI, we have a small staff of two full time keepers and two part-time keepers. Our collection includes 27 different species of animals totaling 60 individual animals housed in 15 different exhibits on our 3.5 acre zoo. In addition, our zoo staff is responsible for the maintenance of the adjacent 15 acre park/picnic area which includes three shelters and two restrooms. Maintenance responsibilities of the park/picnic area include mowing of grass, snow removal, trash removal and picking up sticks that continue to fall from our canopy of mature red oaks.

Our two Black Bears (*Ursus americanus*) have a nice big pool that holds about 3,700 gallons of water. Unfortunately, our original design didn't have any type of filtration system. This meant we were required to dump and fill the pool two to three times a week to keep the water clean (Figure 1). Each week our staff had to dedicate four to six hours toward the cleaning of the pool. This is time which could have been spent on the care of other animals in our collection. Labor alone cost the zoo \$6,000 to \$9,000 every year. In addition, the zoo spent hundreds of dollars each year for over 60,000 gallons of potable water and associated sewer charges.

In the spring of 2017, we relocated our bobcat to the Marshfield Wildwood Zoo (Marshfield, Wisconsin). While there, we were treated to a tour of their recently expanded exhibit for their two Kodiak Bears (*Ursus arctos middendorffi*). Water from the new bear pool was kept clean by recirculating the water through a roughly 18.6 square meter wetland treatment system located

on the backside of the bear exhibit. Our experience in Marshfield inspired us to pursue our own natural sustainable system to maintain the water quality of our bear pool. I called my father, John Ferris a civil engineer, to inquire about natural filtration systems. Being a nerdy engineer, he jumped at the chance to take on the challenge.

Wetlands have sometimes been referred to as nature's kidneys for their ability to purify waters by absorbing wastes such as nitrogen and phosphorus, and storing carbon. Therefore, constructed wetlands, like the one in Marshfield, have been used to take advantage of the treatment processes commonly found in wetlands, physical, chemical



(Opposite page) Billy Bear Chilling In His Pool.
Figure 1. (Right) A bear's bathtub ring



Figure 2. Prairie Treatment System Location

and biological. Constructed wetland treatment systems have been made to treat dirty water from sources that range from animal and domestic wastewater, industrial wastewater, and stormwater runoff.

The system at Marshfield is the type of treatment wetland referred to as a Free Water Surface Constructed Treatment Wetland. The Baraboo staff identified six objectives that were incorporated into the design for the new treatment system which included:

- simple to maintain
- accessible to keepers at all times
- not harmful to the animals
- cannot be damaged by animals
- cannot interfere with operation or maintenance of exhibits
- should not reduce the amount of space used by the public

Consideration was also given to three design issues that some Free Water Surface Treatment Systems, like the one we saw in Marshfield, have been known to struggle with including:

- growth of unsightly algae
- odors from decomposition of pollutants
- the creation of potential breeding habitat for mosquitoes

Working closely with our Parks Department staff, Mr. Ferris suggested that a 7.0 square meter Mesic Prairie Constructed Wetland Treatment System would be a better fit given the unique constraints that we have at the bear exhibit (Figure 2). This system is a type of constructed treatment wetland where water flows horizontally through a bed of gravel. Mesic prairie plants grow in a thin layer of soil covering the gravel bed. Root rhizomes of their deep root systems extend into the gravel where microorganisms colonize a biofilm on the roots and stones. This micro-habitat creates conditions that are capable of removing pollutants by a wide variety of physical, chemical and (micro) biological processes. Pollutants transformed by the biofilm may be taken up by the prairie plants.

The advantage of the Prairie Treatment System over a Free Water Surface system is that the cleaning of the water is underground, allowing the treatment system to fit almost anywhere. This allows the surface to continue to be used for exhibits, landscaping, walks, parking or other public spaces.

Thanks to John's ingenuity, the Prairie Treatment System for our bear pool was designed to fit within the narrow unused landscaped area between the exhibit enclosure and the viewing rail. The design enabled the Baraboo staff to maintain access to the outside of the bear enclosure which is required for routine maintenance and training of the bears. Tapping into the existing drain pipe from the bear pool created an alternate route for the water to flow by gravity through the Prairie Treatment System. Treated water is returned to the pool by a submersible sump pump. Based on John's calculations, the sump pump timer was set to ensure the whole pool has been filtered one to two times per day.

On 14 July 2017 we tested the Bear's pool water for the 5-Day Biochemical Oxygen Demand (BOD_5), Total Ammonia Nitrogen, Total Nitrate Nitrogen, Total Phosphorus and Total Orthophosphate. Ammonia, BOD_5 , Nitrite and Orthophosphorus concentrations were

Figure 3. Treated Pool Water



all below detectable levels of 0.040, 4.0, 0.040 and 0.090 mg/L respectively. The numbers for Nitrate concentrations were in the range of 0.20 to 0.32 mg/L, significantly below the federal and state drinking water quality standard for nitrates, which can be up to 10 mg/L. Total phosphorus concentration came back at around 0.020 to 0.029 mg/L which meets the surface water quality standard for stratified and not stratified lakes and reservoirs which can be up to 0.030 to 0.040 mg/L total phosphorus described in Wisconsin Administrative Code NR 102.06. These data demonstrate why the water in the pool appears clear (Figure 3).

The summer of 2018 was the second summer using this system. The prairie plants have grown beautifully. Due to the clarity of the water in the bear pool, we

have not drained the pool for cleaning at all this summer. An unexpected benefit has been that the pool now serves as nursery for tadpoles for our toads and tree frogs. There is some slight algae growth on the walls of the pool, but we easily can clean that up when time allows. Being able to be flexible with the cleaning is a huge help.

One of the most shocking details about this new system was the low cost and the ease of installation. Total cost of the project was \$7,500. We saved the full installation cost in avoided maintenance by the keepers our first two years. This is vital for a free, city-owned zoo.

In fact, the cost to the zoo was much less. Alliant Energy Foundation provided a \$1,750 Community Grant which paid for educational signage

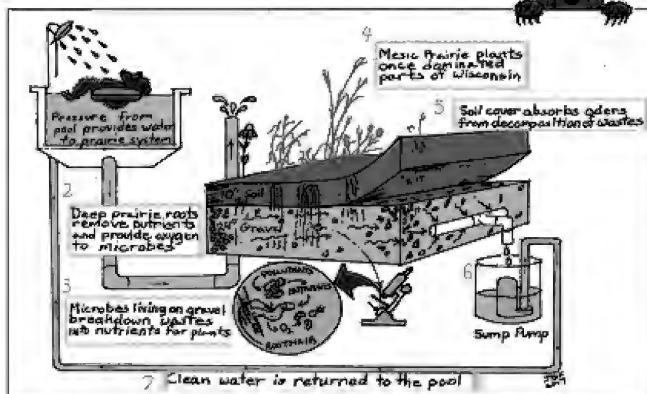
and the materials to construct the project (Figure 4). We used the Parks Department resources to dig the trench for the prairie system, lay the pool liner as well as the installation of the sump pump, and planting of the native plants. Engineering and construction oversight of the Prairie Treatment System was donated by John Ferris, PE. With this new way of filtering pools, conserving water, and allowing for an educational moment, we realized this is beneficial information we could share with other zoos. 

The authors would like to express our thanks to Tori Spinoso, curator for the Ochsner Park Zoo for her leadership and role in constructing the project.

Figure 4. Informational Signage

MESIC PRAIRIE TREATMENT SYSTEM

A Natural Sustainable Solution to Water Quality Problems



Keepers previously drained the bear pool weekly to keep it clean. This sustainable treatment system uses the natural cleaning capabilities of prairie plants to remove wastes from the water in the pool. This saves 100s of hours that keepers can now spend taking care of our animals and saves more than 500,000 gallons of city water per year.

This project was made possible by the generous funding from Alliant Energy. The design and installation assistance was donated by John Ferris, PE.

Coping with Coronavirus Like a ~~Boss~~ Zookeeper

PJ Beaven

ZooFit Coach and Consultant
Puget Sound Chapter of AAZK
Seattle, WA

Times are crazy right now. People are hoarding toilet paper and treating hand sanitizer like it's the golden ticket to survive the apocalypse. If you asked your neighbor how their toilet paper supply was holding up back in January, you would have been called crazy. Now, it's a standard greeting.

It's certainly understandable that many of us are stressed out to the core. Whether it's from working ten to twelve hour shifts, working on skeleton crews, or covering areas you have never worked before, stress is at its peak. Even in situations where you aren't working- anxiety is high for a lot of us.

I've heard many worried concerns from other zookeepers. But as tough as these times are, I know zookeepers are tougher. Heck, most of the protocols health officials are imploring everyone to adhere to are standards we practice every day. Washing our hands? We wash our hands before and after we use the restroom. Not touching our face? We don't want to touch any part of our body because we're never sure if there's dirt, raw meat, blood, urine, poop, or who-knows-what on our hands (I mean, it's why we wash our hands before going to the bathroom). Many of us wear protection when dealing with our animals, including masks, gloves, goggles, and even Tyvek suits.

But, being able to withstand the stress doesn't make it any easier to cope with stress. Luckily, again, we are animal professionals, and all we have to do is turn our attention to the years and years of experience handed down by animal training experts. We've probably all heard sayings such as "go back to kindergarten", "you get the behaviors you reinforce", "focus on the positive", and "set them up for success". These mantras work absolutely fantastic for us in this situation as well.

Let's go through some of these philosophies and see how they can be applied to our daily lives:

Go Back to Kindergarten

Your schedule is completely out of whack. Or you don't have a schedule anymore. What would an animal trainer do in a similar

situation? After a stressful event (such as moving to a new exhibit or facility, or introducing a new animal), are our expectations the same as before the new circumstances were introduced? Probably not. Of course, there are rock-star exceptions, but usually when our animals experience a huge change, we relax our criteria, temporarily, until they get accustomed. Often we call this "lowering the criteria". Karen Pryor describes this concept as "going back to kindergarten".

Typically used in a training situation where the animals have regressed, or plateaued, "going back to kindergarten" doesn't mean we start over from scratch. It means we go back to the baseline where we were achieving success.

Similarly, if we are feeling our lives disrupted, and established habits have diminished considerably, going back to kindergarten may work well for you, too. Lower your expectations until you get back into a groove. You don't have to start over from scratch, just go back to the point where you were achieving success.

For instance, if you developed a habit of going to the gym before your shift (congratulations, by the way- way to take care of your animals by taking care of yourself!), but now you





find your gym is closed, you don't have to start over from scratch, and create a whole new workout routine. We can lower our criteria, and show ourselves some compassion.

We are experiencing a stressful situation.

Exercise is a wonderful way to cope with stress. It helps us clear and focus our thoughts, gives us energy, improves our mood, and prevents illness (probably not the coronavirus, but exercise does strengthen your immune system). But, with the current environment, you don't have to be at the same level as before our circumstances changed so drastically. You can simply incorporate movement into your day- parking further from your unit and walking, practice good deadlift and squat form when picking up feed and grain bags or hay bales, and using broken rake handles (I know you all have them) to stretch your muscles before, during, and after your shift. If you are at home, set a timer to go off every 15-20 minutes to remind you to get up and move just a little- stretch, 10 push-ups, 10 jumping jacks, go up and down a flight of stairs. Just move.

Going back to kindergarten isn't just helpful for fitness and exercise. It can help us cope with this uncertain time by applying the principle to all our habits. Perhaps before COVID-19, you were really improving your eating habits, getting enough sleep, or spending leisure time reading, or with your family. These are aspects that may have been uprooted recently, but going back to basics, returning to a baseline which is easy for you to achieve right here and now, is a great start to getting back to normal.

You Get the Behaviors You Reinforce

A 2013 study after the Boston Marathon bombing showed the more media participants consumed, particularly of media which showed images of the event, the more stress and anxiety they experienced. What surprised the researchers was that the levels of negative stress in watchers was even higher than those who were actually at the event.

The most ironic thing about this whole study, to me, is that the media reported on the study, acknowledged that reporting negative events over and over doesn't help stress and anxiety, but they still continuously focus on hyped-up, dramatized, and sensationalized programs and stories. Why would the media ignore the negative health effects to so much negativity? Because it is heavily reinforced by the general public. The more gory, scandalous, and over-the-top the story or report, the better. It's why Joe Exotic gets so much attention in the media.

We get the behaviors we reinforce with our animals, and we get the behaviors we reinforce from everyone and everything around us. When a behavior deteriorates or regresses, we often have to look at ourselves for the cause. Animals, humans included, are only going to repeat the behaviors with the least amount of effort, that earn them the most reward. This happens in zoos, in an animal's natural environment, and it happens every day with humans.

Our brains, as developed and sophisticated as they are, were not built to handle the amount of input we receive each and every day. Instead of dealing with the occasional lion now and then, we are dealing with the entire jungle constantly roaring at us every day. It's these constant calls for our attention- news alerts, "must watch" television programs, and the barrage of ads, texts, and e-mails.



I'm not saying we should all just quit watching television. Just remember, we get the behaviors, and in this particular case, the programs, that we reinforce. If you find yourself yelling at the television in frustration, perhaps it is time to change the channel. It might just be the best thing you can do for your mental wellness. It's not just the media we reinforce with our attention, we reinforce how we respond to these inputs as well. The more you subject yourself to stress-inducing inputs, the more your brain will produce stress-responsive hormones, which put us in a high-alert, post-traumatic stress disorder mentality.

Fill your attention with updates that affect you personally. Keep up to date with your facility's updates and your local and state recommendations (or mandates) for social distancing/sheltering in place. And then go watch adorable videos of your animals playing with enrichment, or True Facts on YouTube.

Focus on the Positive

With so much negativity in our lives right now, and seemingly no end in sight, it can feel a little hypocritical to be happy. But frankly, that's not just what the world needs right now, it's what our animals need as well. We focus on their positive behavior all the time. Why don't we do it for ourselves?

Practicing daily gratitude is seriously one of the quickest and simplest ways to boost your mood and promote optimism. Dr. Dan Baker, the director of the Life Enhancement Program states, "It is a fact of neurology that the brain cannot be in a state of appreciation and a state of fear at the same time. The two states may alternate, but are mutually exclusive."

So, when we are feeling anxious, stressed, or fearful about events (which we have no control over), take a pause to repeat to yourself things you are grateful for. This practice doesn't just help us be more positive in the moment; practicing daily gratitude promotes uplifting emotions throughout our day as well.

This little gem, focusing on the positive, isn't a Pollyanna view of the world we are experiencing right now. I'm not suggesting you ignore negative feelings completely. Depression and anxiety disorders aren't going to disappear because you are thankful for your family being healthy. But even in animal training, we don't ignore undesired behaviors. We just maintain a focus on the positive behaviors- we redirect, give an LRS (not an ignore), or implement an incompatible behavior. Gratitude works a lot like that. If being grateful is incompatible, in the moment, with stress and fear, then it's definitely worth trying to cope with the anxiety that surrounds us.

Just before the coronavirus took over, I had fallen into what I called my "existential crisis". I wanted to give up on everything I had been working on for the last five years. A good friend encouraged me to keep a gratitude journal for thirty days. Every day, I wrote three things I was grateful for, three things I was looking forward to the next day, three things that went well that day, and three things that needed work. I rolled my eyes, because I knew where this was headed- I couldn't be actively practicing gratitude and stuck in my head at the same time. But I practiced it. Within ten days, I could see a visual difference in my attitude. I had more hope, more excitement, and even though coronavirus had disrupted several opportunities for me, I was experiencing a lot more joy and optimism.

Set Yourself Up for Success

No one walks up for a training session thinking "God, I hope these animals fail!". We even turn training into a fun game where the animal always wins, by focusing on the positive, going back to kindergarten when necessary, and reinforcing the behaviors we want. But the first, and probably most helpful way we achieve our goal is by setting the animal up for success.

To set animals up for success, we ensure we have every tool or piece of equipment necessary for the session. We clear the area of distractions so it's easier to focus. We have a training plan and work at the stage the animal is currently working. This attention to detail is often the difference between a truly great training session, and a fairly frustrating one. I've had my share of both- and learned to set the animal (and myself) up for success.

The success we want to set ourselves up for is being the best zookeeper for our animals. This applies to those of us at home and those working double time to ensure great care. Successful self-care is successful animal care.

That's the first tier- self-care. We set ourselves up for great self-care with actually one simple action- sleep. Most people recognize exercise and nutrition as pillars for a healthy life, but it is sleep that is considered the foundation upon which exercise and nutrition stand. Without proper rest, even our fitness and nutrition suffers. Most experts don't just recommend, they state

quite firmly that humans need seven to nine hours of sleep a night. Sleep sets us up to succeed in whatever our day has in store.

Your day starts the night before. We can set ourselves up for a successful night's rest by planning and preparing to get enough rest throughout the night. Culture has made prioritizing sleep seem like the lazy man's agenda. Nothing could be further from the truth. When we prioritize sleep, we are essentially setting our mind right, which is very much like setting up for a training session before we get started. Those who sleep well each night regularly outperform those with minimal amount of rest.

There are dozens of ways to prepare for a good night's sleep. You can try meditation (the health benefits are astonishing), turning down your thermostat a few degrees and blocking out all lights (we sleep better in cold, dark, and quiet environments), and turning off all electronic devices an hour before going to bed. In essence, remove all distractions which stimulate our brain up and keep us awake. Give your mind and body a chance to recognize it is time to rest and recuperate and make each morning, and each day a masterpiece.

I could write an article ten times longer on all the methods available to help us cope with coronavirus. But if you simply be kind to yourself, go back to kindergarten, reinforce the behaviors you want, and set yourself up for success by taking care of yourself, you won't just survive this pandemic. You will thrive, your animals will thrive, and you'll stand out as a strong example of why zookeepers are truly everyday heroes.

You've got this. I believe in you, and I'll be there for you every step of the way. 

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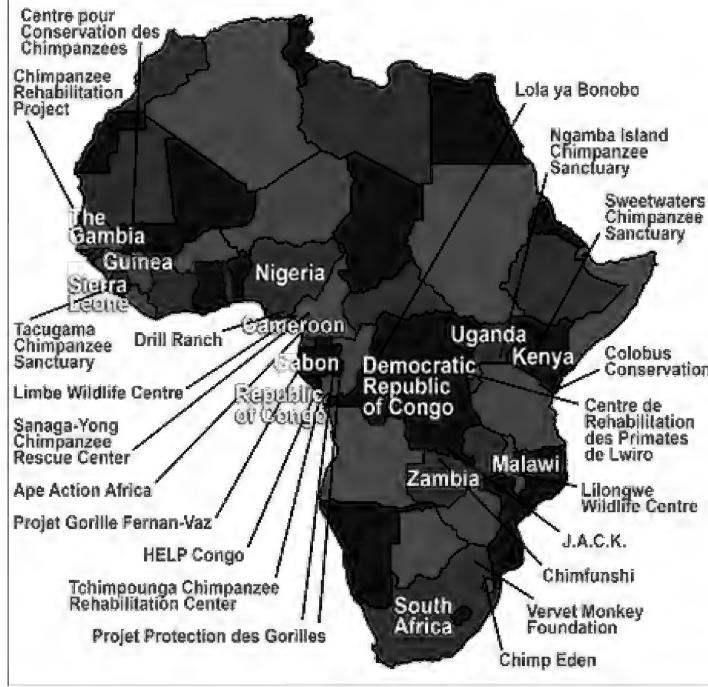
PASA: The largest association of wildlife centers in Africa that you may have never heard of...

Christine Fleener



Mainland Africa is home to 188 species of primate, of which 56.4% are currently threatened by extinction according to a 2018 report by the IUCN Species Survival Commission Primate Specialist Group. These numbers include the *only* wild chimpanzees, bonobos, and gorillas in the world, which are also the *last* remaining great ape species besides the orangutans of southeast Asia and humans. With such an evolutionary treasure so close to total elimination, it is a wonder that we have not demanded a global state of emergency. Instead, so many of these primates are being killed and displaced at a faster rate than ever before (Estrada et al., 2017; Junker et al., 2012), and the duty to protect and conserve these populations has fallen on a courageous few.

For years, many remote sanctuaries and wildlife centers have emerged across Africa to provide care and rehabilitation for local orphaned and injured animals. At first, they could only offer safe haven for the victims of habitat loss or the illegal wildlife trade, but as the centers grew, they discovered new ways to empower their mission. Every time a critically endangered animal was successfully rehabilitated and reintroduced to the wild, a case could be made to expand protection of lands and national parks, safeguarding hundreds of species for years to come (Cheyne, 2009). With a growing staff, the centers could generate more economic stability for their communities and



improve education and awareness about the animals and ecosystems they were fighting to defend. Their impact could go far beyond their original mission, and they knew they would be even stronger if they reached out and worked together. Thus, the Pan African Sanctuary Alliance (PASA) was founded.

In 2000, managers from each of the leading primate sanctuaries and wildlife centers across Africa came together to form PASA. This unification helped generate more robust standards for center management and care protocols and amplified their capacity to address and advocate for a broader range of conservation issues on an international scale. Since their inception, PASA has connected 23 organizations across 13 African countries, establishing the largest organization of wildlife centers in Africa.

Wildlife Rescue and Care

Currently, PASA members care for over 3,000 primates. They do accept other

PASA has connected 23 organizations across 13 African countries, establishing the largest organization of wildlife centers in Africa.

advocate for habitat protection, renewal, and law enforcement, and they conduct widespread surveys and research that help improve our knowledge of these species and influence our conservation methods.

Conservation and Community

Beyond rescue and rehabilitation, the formation of PASA has commanded a louder voice in a global conversation on conservation. PASA now organizes conferences that connect governmental agencies, law enforcement, NGOs, and care centers to establish long-term strategies and training programs for broader-reaching anti-poaching campaigns. Once officials are familiar with the resources and facilities that are available for rescued wildlife, they are far more likely to pursue investigation and recovery of illegally traded animals. PASA also pursues individual rescue cases to ensure the safe confiscation of wildlife and the prosecution of those responsible.

Wildlife centers that were once bound by isolation are now connected to a global community that shares veterinary skills and management techniques. PASA organizes annual Primate Care Training Programs and Veterinary Workshops that update best practices for care staff and prepare centers to accommodate more complicated patients. PASA holds an annual Strategic Development Conference where center representatives can share their insights for long-term planning and where future leaders can seek mentorship.

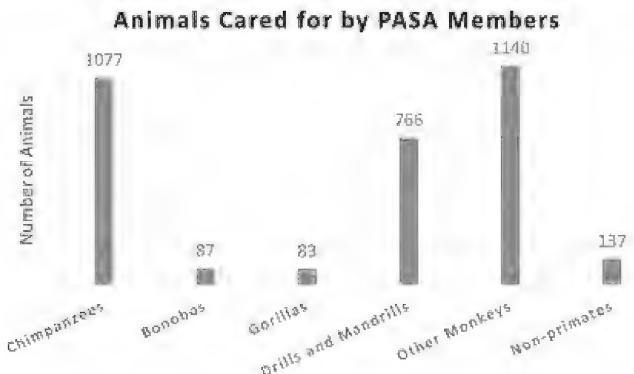
PASA offers resources, supplies, and emergency support for wildlife centers following natural disaster or crisis. When fires and floods damage facilities, war devastates a region, or outbreaks of disease endanger the animals in care, PASA is there to help rebuild and protect.

mammals, birds, and reptiles, but they mostly take in great apes and monkeys, where chimpanzees account for a third of their rescues. Due to the complex life history of chimpanzees, they can be difficult to rehabilitate and even harder to reintroduce to the wild, but **PASA centers are the only centers to have successfully reintroduced chimpanzees to the wild.** PASA represents an extremely special and critical future for primate conservation.

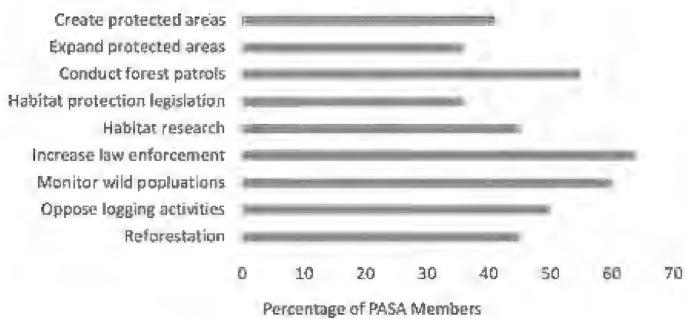
Over the last year alone, PASA members helped facilitate the rescue of around 216 primates from wildlife trafficking, illegal bushmeat trade, and other threats. Even with their impressive record of reintroduction, they still struggle to find ways to accommodate the rise in orphaned chimpanzees, especially when thousands of great apes are lost from the wild every year (Stiles et al., 2016). In response, PASA members have taken action to protect and monitor wild populations. They



PASA is far more than the animal care that they provide. They are a pivotal stronghold in the fight to preserve wildlife, which connects their efforts to local communities and a universal message of stewardship. PASA introduces dozens of educational programs and community development projects that foster pride in local wildlife and create alternative livelihoods that reduce the exploitation of wildlife and their habitats. Today PASA member centers employ over 800 local people, contribute over \$3 million to local economies, and impact over 500,000 people with their community programs. From teaching bee-keeping in Malawi to growing sustainable cashew trees in Guinea or writing children's books and producing inspirational films in Cameroon, PASA and its member organizations forge collaboration between the people and their environment rather than conflict.



How PASA Members Protect Wildlife



Get Involved

While PASA's 23 member centers work hard to preserve the lives of vulnerable wildlife across Africa, the effort is a global one that relies on a large international network of experienced marketing specialists, graphic designers, computer scientists, tech support, legal support, primatologists, veterinarians, zookeepers, and more. Donors keep PASA in the fight to protect endangered wildlife, and zookeepers across America have taken a lead role in supporting PASA's mission.

From sponsoring training programs to donating supplies or visiting the centers themselves, members of AAZK are instrumental. Many AAZK Chapters have organized their own fundraising events to support PASA sanctuary staff and programs, and you can get involved too by organizing your own fundraiser, sharing information about PASA's effort, helping write and apply for grants, or by donating veterinary supplies and used uniforms. If you are interested in visiting one of PASA's care centers in Africa, please go to <https://pasa.org/volunteer-africa/> for details on current volunteer opportunities and reach out to the sanctuaries directly so they can match you to the right position.

PASA's headquarters are currently based in Portland, Oregon and lead by

Executive Director Gregg Tully. Please contact Gregg at gregg@pasa.org or +1 (971) 712-8360 with any additional questions and thank you so much for your support.

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